

We claim:-

1. A process for regenerating a zeolite catalyst which comprises the following
5 stages (I) and (II):
 - (I) Heating a partially or completely deactivated catalyst to 250 - 600°C in an atmosphere which contains less than 2% by volume of oxygen and
 - (II) treating the catalyst at from 250 to 800°C, preferably from 350 to 600°C, with a gas stream which contains from 0.1 to 4% by volume of an oxygen-donating substance or of oxygen or of a mixture of two or more thereof.
- 10 15 2. A process as claimed in claim 1, which additionally comprises the following stage (III):
 - (III) Treating the catalyst at from 250 to 800°C, preferably from 350 to 600°C, with a gas stream which contains from more than 4 to 100% by volume of an oxygen-donating substance or of oxygen or of a mixture of two or more thereof.
- 20 25 3. A process as claimed in claim 1 or 2, wherein the heating according to stage (I) is carried out at a heating rate of from 0.1 to 20, preferably from 0.3 to 15, in particular from 0.5 to 10, °C/min.
- 30 4. A process as claimed in any of claims 1 to 3, wherein the partially or completely deactivated catalyst is washed, before the heating according to stage (I), with a solvent selected from the group consisting of water, an

alcohol, an aldehyde, a ketone, an ether, an acid, an ester, a nitrile, a hydrocarbon and a mixture of two or more thereof.

5. A process as claimed in any of claims 1 to 4, which additionally comprises
the following stage (IV):

- (IV) Cooling of the regenerated catalyst obtained in stage (III) in an inert gas stream which may contain up to 20% by volume of a vaporized liquid selected from the group consisting of water, an alcohol, an aldehyde, a ketone, an ether, an acid, an ester, a nitrile, a hydrocarbon and a mixture of two or more thereof.
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6. A process as claimed in any of the preceding claims, wherein the partially or completely deactivated catalyst is kept at from 250 to 800°C after the heating according to stage (I) and before treatment according to stage (II).
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7. A process as claimed in any of the preceding claims, wherein the oxygen-donating substance is selected from the group consisting of an oxide of nitrogen of the formula N_xO_y , where x and y are chosen to give a neutral oxide of nitrogen, N_2O , an N_2O -containing exit gas stream from an adipic acid plant, NO , NO_2 , ozone and a mixture of two or more thereof.
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8. A process as claimed in any of claims 1 to 6, wherein the oxygen-donating substance is CO_2 and the stages (II) and (III) are carried out at from 500 to 800°C.
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9. A process as claimed in any of the preceding claims; wherein the zeolite catalyst is selected from the group consisting of a titanium-, zirconium-, vanadium-, chromium- or niobium-containing silicalite having the MFI, BEA, MOR, TON, MTW, FER, CHA, ERI, RHO, GIS, BOG, NON, EMT,
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HEU, KFI, FAU, DDR, MTT, RUT, LTL, MAZ, GME, NES, OFF, SGT, EUO, MFS, MCM-22 or MEL structure, the MFI/MEL mixed structure and a mixture of two or more thereof.

- 5 10. The use of a zeolite catalyst regenerated as claimed in any of the preceding claims for the epoxidation of organic compounds having at least one C-C double bond, for the hydroxylation of aromatic organic compounds or for the conversion of alkanes into alcohols, ketones, aldehydes and acids.